

Strategic Goal: Sound Science, Improved Understanding of Environmental Risk, and Greater Innovation to Address Environmental Problems

EPA will develop and apply the best available science for addressing current and future environmental hazards, as well as new approaches toward improving environmental protection.

BACKGROUND AND CONTEXT

Science allows us to identify the most important sources of risk to human health and the environment, and thereby guides our priorities, policies, and deployment of resources. Science provides the understanding and technologies needed to detect, abate, and avoid environmental problems.

In the future, environmental problems will be dealt with using those features of the current system that have proven effective and by designing and testing fundamentally new tools and approaches that utilize the latest advances in scientific knowledge and technology.

MEANS AND STRATEGY

EPA has several strategies to strengthen its science base and to develop innovations in environmental protection that will allow achievement of our strategic objectives. The Agency has implemented a risk-based research planning process to use risk assessment and risk management as principal priority-setting criteria. EPA conducts annual research program reviews to both evaluate the status and accomplishments of its research and determine strategic planning priorities.

To better draw upon expertise of the environmental academic community, EPA created the Science to Achieve Results (STAR) Program of peer-reviewed, mission-driven extramural grants. The Agency is also working with the National Research Council to identify emerging environmental issues for which we must begin planning the necessary research. EPA's research program will increase our understanding of environmental processes and our capability to assess

environmental risks **B** not only to human health, but also to ecosystems.

The emphasis of ecological monitoring research will shift from a Mid-Atlantic integrated assessment of ecosystem health to a Western Pilot demonstration of methods developed in the Mid-Atlantic. In addition, the Coastal Monitoring Initiative beginning in 2000 will fund the first national demonstration of the status and trends monitoring of the health of U.S. estuaries. Knowing the current conditions of these ecosystems, how best to measure those conditions, and what problems exist are important parts of this effort and will provide essential input to the modeling and assessment elements of the program. Process and modeling research will seek to explain stressors and their effect on an ecosystem, as well as the way in which they cause that effect.

EPA also is committed to developing and verifying innovative methods and models for

assessing the susceptibilities of populations to environmental agents, aimed at enhancing current risk assessment and management strategies and guidance. In response to the heightened awareness and concern over children's health risks and the provisions of the new legislation on food safety, EPA established the Children's Health Research Program. In collaboration with the National Institute for Environmental Health Sciences (NIEHS), EPA plans to continue to operate pediatric environmental health centers which conduct basic and applied research in combination with community-based prevention efforts that focus on identifying and preventing environment-related diseases in children. EPA will establish one additional center in addition to the eight existing centers. Children's health research efforts focus on asthma, developmental disorders, and cancer.

The Agency will establish research capability and mechanisms to anticipate and identify environmental or other changes that may portend future risk. A clear vision of future environmental risk will enable EPA to manage strategically for tomorrow and tactically for today. Substantial capability to discern early warnings and patterns of change will be developed through work undertaken on endocrine disruptors. Benefits will include an improved framework for decision-making, increased ability to anticipate and perhaps deter serious environmental risks, and enhanced communication with the public and other stakeholders.

In order to promote decisions which place a high priority on pollution prevention, research will focus on the development of methods and decision tools that are more quantitative and easier for stakeholders and decision-makers to use than those currently available. Research on pollution prevention technology and approaches will accelerate the adoption and incorporation of pollution prevention by developing, testing, and demonstrating techniques applicable across economic sectors. This research will test the ability

of risk assessors and risk managers to develop tools and methodologies which are meaningful and understandable to the public in terms of the costs and benefits associated with the magnitude of the risk reduction options.

A key element of EPA's strategy for reinvention is testing and adopting innovative policy tools designed to achieve better protection at less cost. The Agency has a number of new tools and approaches that are being tested or implemented in various environmental programs, including: market trading and banking, third party certification of environmental performance, and recognition and incentives for environmental stewardship. In each area, EPA is looking to advance the application of the innovative tool or approach by promoting broader testing and incorporation into our system of environmental protection. For example, EPA's Permit Action Plan outlines a broad strategy for building the next generation of environmental permitting. This strategy will harmonize requirements across media, and will make permitting more accessible to the public and more flexible for facilities.

Sector strategies complement current EPA activities by allowing the Agency to approach issues more holistically; tailor efforts to the particular characteristics of each sector; identify related groups of stakeholders with interest in a set of issues; link EPA's efforts with those of other agencies; and craft new approaches to environmental protection.

Sustainable industry programs serve as incubators and developers of innovative approaches to environmental policy making, testing alternative regulatory and programmatic approaches through regional projects, and multi-stakeholder processes. The experience gained in working with six industry sectors on the Common Sense Initiative provides the basis for moving forward with sector-based approaches to environmental protection.

Also, President Clinton created Project XL in March 1995 to provide regulated entities and other stakeholders with the opportunity to develop and implement alternative environmental management strategies that achieve superior environmental performance in exchange for regulatory flexibility. Sector-based approaches will offer valuable supplements to traditional environmental policy and may become the predominant means for environmental protection in the 21st century.

Nearly 7,000 businesses, trade association, citizens groups, state and local governments, and universities are volunteering to improve environmental performance in a timely, cost-effective way through an array of EPA partnership programs. Known collectively as Partners for the Environment, these programs complement traditional regulatory approaches to environmental protection.

Partners set practical, meaningful goals to improve and better protect the environment -- from conserving water and energy

to reducing hazardous emissions, waste, and pesticide risks. These efforts are good for the environment, make good business sense, and prove that pollution prevention pays.

STATUTORY AUTHORITY

- Clean Air Act Amendments of 1990
- Clean Air Act
- Clean Air Act Amendment
- Clean Water Act
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
- Economy Act of 1932
- Environmental Research, Development and Demonstration Act (ERDDA) of 1981
- Federal Advisory Committee Act (5 U.S.C. App.) Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)
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- Federal Technology Transfer Act
- FFDCA of 1988
- Food Quality Protection Act (FQPA) of 1996
- FQPA of 1996
- MPRSA section 33 U.S.C. 26
- National Environmental Policy Act
- Patent Statute
- Pollution Prevention Act of 1990
- Resource Conservation and Recovery Act (RCRA)
- Resources Conservation and Recovery Act
- Safe Drinking Water Act
- Section 309 of the Clean Air Act.
- Superfund Amendments Reauthorization Act
- Toxic Substances Control Act

Resource Summary

(Dollars in thousands)

	FY 1999 Pres. Budget	FY 1999 Enacted
Sound Science, Improved Understanding of Env. Risk and Greater Innovation to Address Env. Problems	\$322,661.8	\$346,996.0
Research for Ecosystem Assessment and Restoration	\$106,489.4	\$111,978.7
S&T	\$105,521.0	\$111,978.7
SF	\$968.4	\$0.0
Research for Human Health Risk Assessment	\$57,063.6	\$50,573.7
EPM	\$18.8	\$18.8
S&T	\$57,001.2	\$50,554.9
SF	\$43.6	\$0.0
Research to Detect Emerging Risk Issues	\$61,639.2	\$56,648.8
EPM	\$5,760.9	\$7,214.4
S&T	\$55,843.3	\$49,434.4
SF	\$35.0	\$0.0
Pollution Prevention and New Technology for Environmental Protections	\$54,246.4	\$77,286.3
EPM	\$374.2	\$857.0
S&T	\$52,515.6	\$76,429.3
SF	\$1,356.6	\$0.0
Increase Use of Integrated, Holistic, Partnership Approaches	\$16,810.5	\$16,390.5
EPM	\$16,810.5	\$16,390.5
Increase Opportunities for Sector Based Approaches	\$11,496.8	\$21,091.7
EPM	\$11,461.8	\$20,156.7
S&T	\$0.0	\$900.0
SF	\$35.0	\$35.0
Regional Enhancement of Ability to Quantify Environmental Outcomes	\$7,995.1	\$6,505.5
EPM	\$4,613.7	\$3,407.6
SF	\$3,381.4	\$3,097.9

Science Advisory Board Peer Review	\$2,586.7	\$2,486.7
EPM	\$2,586.7	\$2,486.7
Incorporate Innovative Approaches to Environmental Management	\$4,334.1	\$4,034.1
EPM	\$4,334.1	\$4,034.1
Total Workyears:	1,212.1	1,194.2

Strategic Objective: Research for Ecosystem Assessment and Restoration

Key Programs

(Dollars in thousands)

	1999 Pres Bud	1999 Enacted
Research: Clean Water Action Plan - Related Research	\$0	\$1,406
Research: Environmental Monitoring and Assessment Program, EMAP	\$36,262	\$33,255

Annual Performance Goals and Measures

RESEARCH: MONITORING DATA FOR ACID DEPOSITION AND UVB

By 1999: Analyze existing monitoring data for acid deposition and UVB and implement a multiple site UVB monitoring system for measuring status and trends

Performance Measures:

Target:

Publish an analysis of the trends in atmospheric deposition and aquatic effects.

30-SEP-99

Baseline: Development of "formal" baseline information for EPA research is currently underway.

RESEARCH: ECOLOGICAL RISK ASSESSMENT

By 1999: Provide ecological risk assessment case studies for two watersheds, final guidelines for reporting ecological risk assessment and ecological risk assessment guidance and support.

Performance Measures:	Target:
Ecological risk assessment guidelines follow-on project report.	30-SEP-99
Report to CENR on use of Ecological Risk Assessment in the Federal Government.	30-SEP-99
Development and use of ecological information management system.	30-SEP-99

Baseline: Development of "formal" baseline information for EPA research is currently underway.

RESEARCH: ECOLOGICAL MONITORING SYSTEM FOR THE MID-ATLANTIC REGION

By 2001: Complete and evaluate a multi-tiered ecological monitoring system for the Mid-Atlantic region and provide select land cover and aquatic indicators for measuring status and trends.

Performance Measures:	Target:
Provide baseline landscape indicators for the Mid-Atlantic Region.	30-SEP-99
Reports on benthic and water quality indicators of condition in estuaries.	30-SEP-99
Publish and analysis of the trends in atmospheric deposition and aquatic effects.	30-SEP-99
Publish Mid-Atlantic region stressor profiles for ozone, acid deposition, pesticides, nitrogen and other stressors.	30-SEP-99

Baseline: Development of "formal" baseline information for EPA research is currently underway.

Strategic Objective: Research for Human Health Risk Assessment

Key Programs

(Dollars in thousands)

	1999 Pres Bud	1999 Enacted
Research: Human Health Research	\$57,001	\$50,324

Annual Performance Goals and Measures

RESEARCH: PESTICIDE EXPOSURE

By 1999: Produce First Generation Exposure Models Describing Residential Exposure to Pesticides

Performance Measures:

Target:

First Generation Residential Exposure Models

30-SEP-99

Baseline: Development of "formal" baseline information for EPA research is currently underway.

RESEARCH: SUSCEPTIBILITIES TO ENVIRONMENTAL AGENTS

By 2008: Develop and verify innovative methods and models for assessing the susceptibilities of populations to environmental agents, aimed at enhancing risk assessment and management strategies and guidelines.

Performance Measures:

Target:

In 1999 award up to 10 peer reviewed STAR research grants that support studies to quantify the exposure of children to organophosphates, trazines and pyrethroids.

30-SEP-99

Baseline: Development of "formal" baseline information for EPA research is currently underway.

Strategic Objective: Research to Detect Emerging Risk Issues

Key Programs

(Dollars in thousands)

	1999 Pres Bud	1999 Enacted
Research: Endocrine Disruptor Research	\$13,469	\$12,230

Annual Performance Goals and Measures

RESEARCH: CHILDREN'S EXPOSURE TO ENDOCRINE DISRUPTING CHEMICALS

By 1999: Initiate Field Exposure Study of Children to 2 EDC's

Performance Measures:

Target:

Protocol for field exposure study of children to 2 EDC's

30-SEP-99

Baseline: Development of "formal" baseline information for EPA research is currently underway.

Strategic Objective: Pollution Prevention and New Technology for Environmental Protections

Key Programs

(Dollars in thousands)

	1999 Pres Bud	1999 Enacted
Research: Common Sense Initiative	\$871	\$867
Research: Advanced Measurement Initiative (AMI)	\$4,000	\$0
Research: Environmental Technology Verification (ETV)	\$7,884	\$6,991

Annual Performance Goals and Measures

RESEARCH: FINE PARTICULATE MODEL

By 1999: Improve Computational Efficiency of Fine Particulate Model by 25%.

Performance Measures:

Target:

Complete parallel algorithms for aerosol dynamics.

30-SEP-99

Baseline: Development of "formal" baseline information for EPA research is currently underway.

Strategic Objective: Increase Use of Integrated, Holistic, Partnership Approaches

Key Programs

(Dollars in thousands)

	1999 Pres Bud	1999 Enacted
Sustainable Development Challenge Grants*	\$0	\$4,702
*In FY 1999 President's Budget assigned to Goal 1		
Regional Geographic Program	\$12,045	\$8,673

Strategic Objective: Increase Opportunities for Sector Based Approaches

Key Programs

(Dollars in thousands)

	1999 Pres Bud	1999 Enacted
Project XL	\$3,360	\$3,360
Common Sense Initiative	\$3,813	\$3,813

Annual Performance Goals and Measures

RESEARCH: PROJECT XL

By 1999: A total of 50 Project XL projects will be in development or implementation, an increase of 23 over 1998.

Performance Measures:

Target:

Number of Project XL projects in implementation.

50 Projects

Baseline: Development of "formal" baseline information for EPA research is currently underway.

Strategic Objective: Regional Enhancement of Ability to Quantify Environmental Outcomes Key Programs

Key Programs

(Dollars in thousands)

	1999 Pres Bud	1999 Enacted
Regional Science and Technology	\$7,995	\$6,407

Strategic Objective: Incorporate Innovative Approaches to Environmental Management***Key Programs***

(Dollars in thousands)

	1999 Pres Bud	1999 Enacted
Reinvention Programs, Development and Coordination	\$4,334	\$4,334

EXTERNAL FACTORS

Sound science is predicated on the desire of the Agency to make human health and environmental decisions based on sound scientific data and information. It challenges the Agency to apply the best available science and technical analysis when addressing health and environmental problems that adversely impact the United States. Such a challenge

moves the Agency to a more integrated, efficient, and effective approach of reducing risks to both human health and the environment. As long as sound science is a central tenant for actions taken by the Agency, then external factors will have a minimal impact on the goal.

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

EPA has several strategies to validate and verify performance measures in the area of environmental science and technology research. Most performance measures are verifiable through quantitative means. For those measures that are output-oriented, actual outputs or products can be objectively verified. Because the major output of research is technical information, primarily in the form of reports, software, protocols, etc., key to the validation and verification strategies is the performance of both peer and quality assurance reviews.

Scientific research plans, products, and proposals all are scrutinized by independent entities, such as the Science Advisory Board (SAB). EPA's Board of Scientific Councilors (BOSC), established under the Federal Advisory Committee Act, evaluates the effectiveness and efficiency of each Laboratory and Center within the Office of Research and Development, including areas such as peer reviews.

Peer reviews provide assurance during the pre-planning, planning, and reporting of environmental science and research activities that the work meets peer expectations. Only those science activities and resulting information products that pass Agency peer review are addressed and

published. This applies to program-level, project-level, and research outputs.

The quality of the peer review activity is monitored by EPA to ensure that peer reviews are performed consistently, according to Agency policy, and that any identified areas of concern are resolved through discussion or the implementation of corrective action.

A quality assurance system is implemented at all levels in the EPA research organization. The Agency-wide quality assurance system is a management system that provides the necessary elements to plan, implement, document, and assess the effectiveness of quality assurance and quality control activities applied to environmental programs conducted by or for EPA.

This quality management system provides for identification of environmental programs for which Quality Assurance/Quality Control (QA/QC) is needed, specification of the quality of the data required from environmental programs, and provision of sufficient resources to assure that an adequate level of QA/QC is performed.

Performance within the Office of Policy will be verified by identifying customer usage of economic

resources within the Office of Policy, and by surveying customers to determine adequacy and

satisfaction with economics information available and provided.